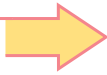


87 Too Many Mussels?



Having completed his research project, Ondar has a dilemma. He wants to do something about the problem of introduced species. He's particularly concerned about zebra mussels, which have been found in rivers and lakes around his state. What, if anything, should he do?

CHALLENGE



What are the trade-offs of trying to control an introduced species?

MATERIALS



For each student

- 1 Student Sheet 87.1, "Zebra Mussels: Problems and Proposals"

Student Sheet 77.2, "Anticipation Guide: Introduced Species—Zebra Mussels," from Activity 77



In this photo, you can see zebra mussel shells piled along the beach in a stack more than a foot high.

PROCEDURE

1. Read the statements that follow.
2. Complete Student Sheet 87.1, “Zebra Mussels: Problems and Proposals.”
3. Decide what you would do if you were Ondar.

Johnson Poole, Engineer, Mantee Water Treatment Plant



A worker uses a hose to suction zebra mussels from inside a pipe at a power plant.

“Zebra mussels cause a lot of problems for us. We supply water to the city of Mantee. It’s our job to provide clean water for homes and businesses. To do that, large pipes bring water into the plant from Bear Lake. Here at the plant, we filter and treat the water before sending it on to the city.

“But we’ve had a hard time lately getting the water into the plant. Those zebra mussels grow on everything, including the insides of the pipes. We have seen up to 750,000 zebra mussels in a square meter of pipe! As you might imagine, all of these zebra mussels begin to block the flow of water.

“Right now, we shut down the plant every few months. Then we send someone into the pipes to physically remove all the mussels. This costs tons of money—the U.S. Fish and Wildlife Service reports that dealing with this problem in the Great Lakes area alone has cost billions of dollars!

“In the meantime, we’re looking at other solutions. For instance, we’re exploring ways to prevent zebra mussels from settling and growing on the pipes in the first place. Zebra mussels grow best on hard surfaces, such as rocks. That’s also why they sometimes grow on other animals with hard shells like clams. We’re trying to find out if we can coat the pipes with some type of paint or something else that would prevent the mussels from growing on them. You could say we’re trying to make the pipes a less suitable habitat for the mussels!”

Adrienne Vogel, Chemist, Bear Industrial Company

“Our company uses water from Bear Lake. Chemicals have been shown to kill both larval and adult zebra mussels. That’s one way we prevent zebra mussels from growing in our water supply. We can’t afford for zebra mussels to grow inside our water containment ponds. So, after the water comes into our plant, we treat it with a variety of chemicals. While this is very effective in dealing with the zebra mussels, the treated water does contain

a lot of chemicals. This means that we can't release the water back into the lake as is. Luckily for us, we are able to recycle and re-use the water within the company for several months. Before we release the water, we treat it to isolate the chemicals and dispose of them according to state regulations. But this all costs money."

Talia Mercata, Biologist, State Fish and Wildlife Service

"I sympathize with the people at both plants. Humans are not the only ones that are affected by zebra mussels. Zebra mussels may be changing the native ecology of lakes and rivers. We know that Bear Lake is clearer as a result of zebra mussels. Zebra mussels. Pollution from a nearby industry had caused the algae to grow out of control, making visibility very poor. Fish were dying because of the lack of oxygen. One thing is certain—zebra mussels have filtered out most of that algae. Some people think that is a good thing. Now that the fish have come back, however, we are worried that the zebra mussels will change the food webs in the lake.

"Some scientists are investigating how predators may help control zebra mussel populations. In Europe, where zebra mussels first came from, there are a lot more native predators, such as fish that have teeth. Here in the U.S., the populations of fish that might be good predators aren't that high.

"Ducks are one possible predator here in the U.S. But using predators to control zebra mussels is complicated. How do you control where ducks and fish decide to search for food? How can you guarantee that they'll eat zebra mussels and not some other food? How will they reduce populations in hard-to-reach areas, such as inside pipes? What happens if the introduction of the predator causes other imbalances in the ecosystem?



"Because of these difficulties, my research focuses on the use of parasites to control zebra mussels. If my research is successful, I may identify a parasite that could infect and kill zebra mussels. I'm not sure how quickly this would affect their populations, though."


Henry Wai, Activist, People for Responsible Action

"It's a shame that zebra mussels were ever introduced into the United States. We can only predict how they'll affect the ecology of our lakes and rivers. We don't know for sure.

“People caused this problem in the first place and I think every person should take responsibility for trying to prevent further damage. It’s easy to forget that things we do every day might contribute to the problem of introduced species, but it’s true.

“For example, just carrying equipment like inner tubes and diving gear from one lake to another can introduce a species like the zebra mussel. After all, its larval stage is very small. That’s why it’s important for people to rinse and dry their equipment before going from one body of water to another. Think about it—if every boater, fisher, swimmer, and diver took care to clean off his or her equipment, we might prevent zebra mussels and other organisms from spreading across the U.S. so quickly!”


ANALYSIS

-  1. What, if anything, do you think should be done about the growing population of zebra mussels in the United States? Support your answer with evidence and discuss the trade-offs of your decision.

Hint: To write a complete answer, first state your opinion. Provide two or more pieces of evidence that support your opinion. Then discuss the trade-offs of your decision.



EXTENSION

-  Go to the *Issues and Life Science* page of the SEPUP website for links to sites with information about zebra mussels and management options.